

P29883.A03

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants : Dieter LEHMANN et al.

Appln. No. : 10/577,619

Group Art Unit: Not Known

I.A. Filed : October 22, 2004

Examiner: Not Known

For : RADICALLY COUPLED PTFE POLYMER COMPOUNDS AND METHOD  
FOR THE PRODUCTION THEREOF

**PRELIMINARY AMENDMENT**

Commissioner for Patents  
U.S. Patent and Trademark Office  
Customer Service Window, Mail Stop **Amendment**  
Randolph Building  
401 Dulany Street  
Alexandria, VA 22314

Sir:

Prior to examination and calculation of filing fees of the above-identified patent application, entry of the following amendment is respectfully requested.

**Amendments to the Specification** begin on page 2 of this paper.

**Amendments to the Claims** begin on page 6 of this paper.

**Remarks** begin on page 10 of this paper.

## AMENDMENTS TO THE SPECIFICATION

Please amend the specification as follows:

Page 1, between lines 2 and 3, please insert the section header:

### **Field of the Invention**

Page 1, between lines 5 and 6, please insert the section header:

### **Background Information**

Page 3, between lines 20 and 21, please insert the section header:

### **Summary of the Invention**

Page 3, between lines 24 and 25, please insert the following paragraphs:

The present invention provides a radically coupled polytetrafluoroethylene polymer compound comprising at least one of radiation-chemically and plasma-chemically modified polytetrafluoroethylene powder including a surface, and at least one olefinically unsaturated polymer chemically radically coupled on the surface via a reactive conversion into melt.

The present invention also provides a method for producing a radically coupled polytetrafluoroethylene polymer compound comprising at least one of radiation-chemically and plasma-chemically modified polytetrafluoroethylene powder including a surface, and at least one olefinically unsaturated polymer chemically radically coupled on the surface via a reactive conversion into melt, comprising forming a melt of reactively converted polytetrafluoroethylene powder and at least one olefinically unsaturated polymer, the polytetrafluoroethylene powder including reactive perfluoroalkyl-(peroxy) radical centers after at least one of radiation-chemical and plasma-chemical modification.

The bonding site of the at least one olefinically unsaturated polymer with the surface can be randomly distributed on the polymer chain.

The polytetrafluoroethylene powder can be radiation-chemically modified.

The polytetrafluoroethylene powder can be radiation-chemically modified with a radiation dose greater than 50 kGy.

The polytetrafluoroethylene powder can be radiation-chemically modified with a radiation dose greater than 100 kGy.

The polytetrafluoroethylene powder can be radiation-chemically modified in presence of reactants.

The polytetrafluoroethylene powder can be radiation-chemically modified under influence of oxygen.

The at least one olefinically unsaturated polymer can include olefinically unsaturated groups in at least one of main chain and side chain of the at least one olefinically unsaturated polymer.

SBS, ABS, SBR, NBR, NR and other butadiene and/or isoprene-homo-, -co- or -ter-polymers can be radically coupled as olefinically unsaturated polymers.

The polytetrafluoroethylene powder can be a micropowder.

The reaction into a melt can be performed in a melt mixer.

The reaction into a melt can be performed in an extruder.

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Page 3, please delete the paragraph appearing at lines 25 and 26.

Page 3, between lines 26 and 27, please insert the section header:

**Detailed Description**

Page 7, between lines 14 and 15, please insert the section header:

**Examples**

**Amendments To the Abstract**

Please replace the Abstract with following amended Abstract:

**Abstract of the Disclosure**

~~The invention relates to the field of chemistry and relates to radically~~ Radically coupled PTFE polymer compounds ~~that can be used~~ useful, for example, as tribo materials, and a method for the production thereof. ~~The object of the invention is to disclose radically~~ Radically coupled PTFE polymer compounds are provided which exhibit improved wear resistances with comparable gliding properties, and furthermore there is provided a simple and efficient method for the production of such compounds. ~~The object is attained through radically~~ Radically coupled PTFE polymer compounds are provided comprising radiation-chemically and/or plasma-chemically modified PTFE powders, on the particle surface of which olefinically unsaturated polymers are chemically radically coupled by a reactive conversion into a melt. ~~The object is further attained through~~ There is also provided a method for producing radically coupled PTFE polymer compounds, in which PTFE powders are reactively converted with reactive perfluoroalkyl-(peroxy) radical centers after a radiation-chemical and/or plasma-chemical modification into a melt with the addition of olefinically unsaturated polymers.

# AMENDMENTS TO THE CLAIMS

The claims in this listing will replace all prior versions, and listings, of claims in the application.

## Listing of Claims:

1. (Currently Amended) Radically coupled PTFE polytetrafluoroethylene polymer compounds compound comprising at least one of radiation-chemically and/or and plasma-chemically modified PTFE powders polytetrafluoroethylene powder including a surface, on the particle surfaces of which and at least one olefinically unsaturated polymers are polymer chemically radically coupled on the surface via a reactive conversion into melt.

2. (Currently Amended) Radically The radically coupled PTFE polytetrafluoroethylene polymer compounds compound according to claim 1, in which the wherein bonding site of the at least one olefinically unsaturated polymers polymer with the PTFE particle surface is randomly distributed on the polymer chain.

3. (Currently Amended) Radically The radically coupled PTFE polytetrafluoroethylene polymer compounds compound according to claim 1, in which wherein the PTFE polytetrafluoroethylene powder is radiation-chemically modified.

4. (Currently Amended) Radically The radically coupled PTFE polytetrafluoroethylene polymer compounds compound according to claim 3, in which wherein the PTFE polytetrafluoroethylene powder is radiation-chemically modified with a radiation dose greater than 50 kGy.

5. (Currently Amended) ~~Radically~~ The radically coupled ~~PTFE~~ polytetrafluoroethylene polymer compounds compound according to claim 4, ~~in-which~~ wherein the ~~PTFE~~ polytetrafluoroethylene powder is radiation-chemically modified with a radiation dose greater than 100 kGy.

6. (Currently Amended) The radically coupled ~~PTFE~~ polytetrafluoroethylene polymer compounds compound according to claim 1, ~~in-which~~ wherein the ~~PTFE~~ polytetrafluoroethylene powder is radiation-chemically modified ~~in the~~ presence of reactants.

7. (Currently Amended) ~~Radically~~ The radically coupled ~~PTFE~~ polytetrafluoroethylene polymer compounds compound according to claim 6, ~~in-which~~ wherein the ~~PTFE~~ polytetrafluoroethylene powder is radiation-chemically modified under the influence of oxygen.

8. (Currently Amended) ~~Radically~~ The radically coupled ~~PTFE~~ polytetrafluoroethylene polymer compounds compound according to claim 1, ~~in-which~~ wherein the ~~polymers have at least one olefinically unsaturated polymer includes olefinically unsaturated groups in the at least one of main chain and/or in the and side chain of the at least one olefinically unsaturated polymer.~~

9. (Currently Amended) ~~Radically~~ The radically coupled ~~PTFE~~ polytetrafluoroethylene polymer compounds compound according to claim 1, ~~in-which~~ wherein SBS, ABS, SBR, NBR, NR and other butadiene and/or isoprene-homo-, -co- or -ter-polymers are radically coupled as olefinically unsaturated polymers.

10. (Currently Amended) Method for producing a radically coupled ~~PTFE~~ polytetrafluoroethylene polymer compounds compound according to one of claims 1 through 9, ~~in-which~~ PTFE comprising at least one of radiation-chemically and plasma-chemically modified polytetrafluoroethylene powder including a surface, and at least one olefinically unsaturated

polymer chemically radically coupled on the surface via a reactive conversion into melt,  
comprising reactively converting in a melt ~~powders are reactively converted~~  
polytetrafluoroethylene powder and at least one olefinically unsaturated polymer, the  
polytetrafluoroethylene powder including with reactive perfluoroalkyl-(peroxy) radical centers  
after [[a]] at least one of radiation-chemical and/or and plasma-chemical modification into a melt  
with the addition of olefinically unsaturated polymers.

11. (Currently Amended) ~~Method~~ The method according to claim 10, ~~in which~~ wherein  
the polytetrafluoroethylene powder comprises radiation-chemically modified PTFE  
polytetrafluoroethylene powder is used.

12. (Currently Amended) ~~Method~~ The method according to claim 10, ~~in which~~ wherein  
the PTFE polytetrafluoroethylene powder is radiation-chemically modified with a radiation dose  
greater than 50 kGy.

13. (Currently Amended) ~~Method~~ The method according to claim 12, ~~in which~~ wherein  
the PTFE polytetrafluoroethylene powder is radiation-chemically modified with a radiation dose  
greater than 100 kGy.

14. (Currently Amended) ~~Method~~ The method according to claim 10, ~~in which~~ wherein  
the PTFE polytetrafluoroethylene powder is radiation-chemically modified in the presence of  
reactants.

15. (Currently Amended) ~~Method~~ The method according to claim 14, ~~in which~~ wherein  
the PTFE polytetrafluoroethylene powder is radiation-chemically modified under the influence  
of oxygen.

16. (Currently Amended) ~~Method~~ The method according to claim 10, ~~in which~~ wherein  
the PTFE polytetrafluoroethylene powder is used as a micropowder.



17. (Currently Amended) ~~Method~~ The method according to claim 10, ~~in-which~~ wherein the reaction into a melt is ~~realized~~ performed in a melt mixer.

18. (Currently Amended) ~~Method~~ The method according to claim 17, ~~in-which~~ wherein the reaction into a melt is ~~realized~~ performed in an extruder.

19. (Currently Amended) ~~Method~~ The method according to claim 10, ~~in-which~~ wherein ~~polymers with olefinically unsaturated groups in the main chain and/or in the side chain are used~~ the at least one olefinically unsaturated polymer includes olefinically unsaturated groups in at least one of main chain and side chain of the at least one olefinically unsaturated polymer.

20. (Currently Amended) ~~Method~~ The method according to claim 10 ~~in-which~~ as the at least one olefinically unsaturated polymer ~~polymers~~, is SBS, ABS, SBR, NBR, NR and other butadiene- and/or isoprene-homo-, -co- or -ter-polymers ~~are used~~.

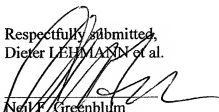
REMARKS

Entry of the foregoing amendment prior to examination of the above-identified patent application is respectfully requested.

Applicants note that the instant amendment has been prepared to place the application including the specification, abstract and claims 1-20 more in conformance with idiomatic English and standard U.S. practice. Applicants submit that the instant amendment has not been made for any reasons related to patentability such that no estoppel should be deemed to attach.

Should there be any questions, the Examiner is invited to contact the undersigned at the below-listed telephone number.

Respectfully submitted,  
Dieter LEHMANN et al.



Neil F. Greenblum  
Reg. No. 28,394

January 22, 2007  
GREENBLUM & BERNSTEIN, P.L.C.  
1950 Roland Clarke Place  
Reston, VA 20191  
(703) 716-1191

Arnold Turk  
Reg. No. 33094